

What Is Claimed Is:

1. A method for fabricating a capacitor of a semiconductor device comprising:

forming a first insulating layer by nitrifying a semiconductor substrate using a forming gas;

forming a second insulating layer by depositing a transition element on the first insulating layer and performing a reoxidation process;

forming a third insulating layer by nitrifying the second insulating layer using a forming gas; and

forming a conducting layer on top of the third insulating layer.

2. A method as defined in claim 1, wherein a conducting layer is formed on the semiconductor substrate prior to forming the first insulating layer.

3. A method as defined in claim 1, wherein the forming gas comprises N₂ gas or a gas mixture including N₂.

4. A method as defined in claim 1, wherein at least one of the first insulating layer, the second insulating layer, and the third insulating layer is formed using a furnace process.

5. A method as defined in claim 4, wherein the furnace process is performed at a temperature of about 200~450°C.

6. A method as defined in claim 1, wherein the transition element is one of Ta, Al, Zr, V, Ti, Ni and Hf.
7. A method as defined in claim 1, wherein the transition element is deposited by PVD or CVD.
8. A method as defined in claim 1, wherein the reoxidation process is performed at a temperature of about 700~950°C by a rapid thermal treatment method.
9. A method as defined in claim 1, wherein the second insulating layer has a thickness of about 5~500 Å.
10. A method as defined in claim 1, wherein the conducting layer comprises one of: polysilicon, Si, Al, V, Ni, Cu, Co, W, Ta, Ti, and an alloy comprising at least one of polysilicon, Si, Al, V, Ni, Cu, Co, W, Ta, and Ti.
11. A method as defined in claim 1, wherein the conducting layer is formed by PVD or CVD.
12. A method as defined in claim 1, wherein the substrate includes at least a predetermined capacitor structure.

13. A method for fabricating a capacitor of a semiconductor device comprising:

forming a first insulating layer by nitrifying a semiconductor substrate using a forming gas;

forming a second insulating layer including a transition element oxide on the first insulating layer;

forming a third insulating layer by nitrifying the second insulating layer using a forming gas; and

forming a conducting layer on top of the third insulating layer.

14. A method as defined in claim 13, wherein forming the second insulating layer comprises performing CVD.

15. A method as defined in claim 13, wherein the second insulating layer comprises an oxide of one of Ta, Al, Zr, V, Ti, Ni, and Hf.

16. A capacitor of a semiconductor device comprising:

a substrate;

a first insulating layer on the substrate;

a second insulating layer including a transition element oxide on the first insulating layer;

a third insulating layer on the second insulating layer; and

a conducting layer on the third insulating layer.

17. A capacitor as defined in claim 16, wherein a conducting layer is located between the substrate and the first insulating layer.

18. A capacitor as defined in claim 16, wherein the transition element oxide layer comprises an oxide of at least one of Ta, Al, Zr, V, Ti, Ni, and Hf.

19. A capacitor as defined in claim 16, wherein the first and the third insulating layers are nitride layers.